

PREPRODUCTION INITIATIVE O2/N2 GENERATOR OIL/WATER SEPARATOR TEST PLAN

SITE: MCAS CHERRY POINT

1.0 OBJECTIVE

This test plan describes the data collection procedure for evaluating the use of an oil/water separator in a Navy/Marine Corps operational environment. The data will be used to determine the system's efficiency, effectiveness, and overall success with respect to separating the oil from an oil/water emulsion produced by the O2/N2 generator. The environmental and cost benefits of the oil/water separator will be compared to disposal of the emulsion.

2.0 DESCRIPTION

The O2/N2 generator compresses ambient air to produce purified liquid or gaseous oxygen and nitrogen. The oxygen produced is used to supply breathing air for aviators and in crew survival kits. The nitrogen produced is used in the struts, landing gear, and wheels of aircraft and to preserve equipment during shipment between locations. During the compression of ambient air, humidity in the air forms water, which mixes with the oil that lubricates the compressor's screws and forms an oil/water emulsion. At MCAS Cherry Point, this emulsion is currently discharged to a 55-gallon drum and disposed of.

The Ingersoll Rand PS-1125 oil/water separator consists of a main reservoir in which gravity separation of the oil/water emulsion occurs. Oil separated from the emulsion is directed to a 2-gallon polypropylene container. The water then moves to a separate holding chamber. From the holding chamber, water is fed to an alumino-silicate filter by a pneumatic pump driven by the O2/N2 generator. After passing through the filter, the water is directed to a 55-gallon drum for disposal.

3.0 TEST PLAN

This test plan will be used to evaluate the effectiveness of the PS-1125 manufactured by Ingersoll-Rand. Quantitative and qualitative data will be collected and used to evaluate the system's ability to separate oil for reuse and to purify water for reduced disposal costs.

3.1 Approach

One PS-1125 will be used during the implementation of this test plan. Quantitative and qualitative data will be collected through completion of the Daily Log Sheet and the Monthly Maintenance and Repair Log.

3.2 Instructions for Completing the Daily Log Sheet

The Daily Log Sheet is a modified version of the standard daily log used at the MCAS Cherry Point O2/N2 Generating Plant. It has been modified by the addition of lines for recording the following information:

- Time Measurement Taken: Record the time at which the oil and water volumes were measured.
- Volume of Oil: Record the volume of oil in the 2-gallon container.
- Rate & Name: Record the rate and name of the individual taking the measurements.

Measurements should be taken at approximately the same time daily, as consistent with site operations.

3.3 Instructions for Completing the Monthly Maintenance and Repair Log

Please record the month in the space provided at the top of the page.

Once per week, a sample of water discharged from the adsorption module should be compared to tap water. If the water from the adsorption module is cloudier than the tap water, the adsorption module should be changed. In the space provided for Item 1, record the date that each sample was collected and the result of its comparison with tap water. (Five date lines are included for months with five weeks.)

In response to Item 2, indicate whether the PS-1125 required repairs during the month. If not, Items 3 through 6 can be skipped. If the unit required repairs, please respond to Items 3 through 6. NOTE: If the PS-1125 requires repairs, they should be arranged through Ken Wright or Manwai Wong (see Section 4.1 for contact information).

Space is provided at the bottom of the page for additional comments regarding the PS-1125's performance, operation, and interface with site operations and any other relevant comments. Additional sheets may be used if necessary.

4.0 REPORTING

MMC Pestka has approved the use of these log sheets for this project. As previously described, the Daily Log Sheet will be completed at the site's typical frequency, with measurements of the volume of oil recovered made once per day. The first question on the Monthly Maintenance and Repair Log will be completed on a weekly basis, and Items 2 through 6 will be completed once per month. Data will be collected for a period of approximately one year. During the evaluation period, fax the data sheets to Ken Wright (see Section 4.1, Points of Contact, for the fax number) monthly, at a minimum. The final report, to be prepared by UTRS, will include information on the system's safety, overall performance, cost-effectiveness, and ability to interface with site operations.

4.1 Points of Contact

At any time during the prototype period, if the equipment malfunctions or you need consumables or technical support, please contact the assigned POC at UTRS and/or NAVAIR Lakehurst as listed below. Do not contact the vendor directly—unless there is an emergency. Do not make any repairs to the equipment without specific direction from the vendor as this may invalidate warranties. Please discuss any ideas you may have regarding equipment modifications or improvements with NAVAIR Lakehurst or UTRS; do not discuss your ideas with the vendor as contractual problems may arise. NAVAIR Lakehurst and UTRS will arrange and procure all reasonable orders for consumables and repairs as soon as possible to ensure minimal impact to your site's operations. Please keep in mind that regular communication with NAVAIR Lakehurst and UTRS, and regular submittal of your data sheets are both vital to the success of this technology demonstration.

POC	Ken Wright	Manwai Wong
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		TC1	TC2	TC3	TC4	TC5	TC6	TC7	TC8	TC9	TC10	TC11	TC12	LI2	FI6	PI4	FI5	FI5	PI3	PI2	LI1	FI7	PI5	DPI1	V2	PRV 6	DP1	TTI1	P19	V7	SI2	F3	F3A	V40/41		
	LPC HOUR METER	AMBIENT	COMPRESSOR OIL	HX2/3 AIR IN	RPSA PURGE IN	WASTE AIR OUT	COL 1 W.G. OUT	HX2/3 WG IN	EXPANDER IN	EXPANDER OUT	EXPANDER BRG	PCV1 IN	O2 RICH LIQUID	HP COL – IN H2O	LN2 ORIFICE	HP COLUMN – PSI	REFLUX-IN H2O O2	REFLUX-IN H2O N2	EXPANDER IN-PSI	RPSA PURGE-PSI	LP COL-IN H2O O2/N2	LO2 ORIFICE	LP COLUMN-PSI	LOX PUMP-IN H2O	PURGE BP-O/C	RPSA Pressure Regulating Valve	DP (F3) PSI	CHECKED OIL INDICATOR	COMP OUTLET-PSI	OPENED V7	TESTED SI2 SOLENOID	TESTED F3 SOLENOID	TESTED F3A SOLENOID	PROD PURITY	LIQUID LEVEL	TANK ID #
LOW			200	80	AMB	AMB	-300	-290	-200	-290	70	-264	-280	5.5	20	60	30	0	130		7	20	7	90			5	SAT	140	SAT	140	SAT	SAT	SAT		
NORM		AMB	220					-292		-292	85	-266			24				134	5.5		24			O/C	90	3		146		146					
HIGH			230	90	85	85	-310	-293	-205	-293	100	-267	-285	8.5	30	72	55	5	138		10	30	11	100			1	UNSAT	150	UNSAT	150	UNSAT	UNSAT	UNSAT		
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Time Measurement Taken: _____

Volume of Oil: _____

Rate & Name: _____

PLANT SUPERVISOR:_____

TBX SERIAL NO:_____

DAILY HOURS: _____

TOTAL HOURS: _____

**2.0 TON PER DAY O2/N2 GENERATING PLANT
OIL/WATER SEPARATOR
MONTHLY MAINTENANCE AND REPAIR LOG**

Month: _____

Maintenance

1. Once each week, please record the condition of the water discharged from the adsorption module:

Date: _____ Condition (circle one): Cloudy/Clear

Date: _____ Condition (circle one): Cloudy/Clear

Date: _____ Condition (circle one): Cloudy/Clear

Date: _____ Condition (circle one): Cloudy/Clear

Date: _____ Condition (circle one): Cloudy/Clear

Repairs

2. Were any repairs to the oil/water separator required this month (check one)?
Yes ☐ No ☐ (if no, skip questions 3 through 6)

3. Describe the nature of problem: _____

4. Identify the parts required to complete the repair: _____

5. Man-hours required to perform the repair: _____

6. Total time the oil/water separator was out of service due to this problem: _____

Additional Comments

Please comment on the performance, operation, and interface with site operations of the PS-1125 (use additional sheets if necessary): _____

